



EUROPEAN CENTRAL BANK

EUROSYSTEM

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OF SUPPLY
CONSTRAINTS ON
BANK LENDING
IN THE EURO AREA
CRISIS INDUCED
CRUNCHING?**

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In 2010 all ECB publications feature a motif taken from the €500 banknote.

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Abstract

Aggregate loan development typically hinges on a combination of factors that impact simultaneously on the demand and the supply side of bank lending. The financial turmoil starting in mid-2007 had detrimental consequences for banks' balance-sheets, cost of funds and profitability, thus weighing negatively on their ability to supply new loans. This paper examines the impact of supply constraints on bank lending in the euro area with a special focus on this turmoil period. The empirical evidence presented suggests that banks' ability and willingness to supply loans affects overall bank lending activity in general and has done so particularly during the financial crisis. Applying a cross-country panel-econometric approach using a unique confidential data set on results from the Eurosystem's bank lending survey allows us to disentangle loan supply and demand effects. We find that even when controlling for the effects coming from the demand side loan growth is negatively affected by supply-side constraints. This applies both for loans to households for house purchase and for loans to non-financial corporations. We furthermore provide evidence that the impact of supply-side constraints, especially related to disruptions of banks' access to wholesale funding and their liquidity positions, was reinforced since the eruption of the financial crisis and corresponding adjustments in banks' loan portfolios seem to have been geared primarily via prices rather than outright quantity restrictions.

Keywords: bank credit, loan supply constraints, euro area, panel data

JEL classification: C23, E51, E52, G21

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NON-TECHNICAL SUMMARY

The banking sector was at the centre of the financial crisis 2007-9 and highlighted its crucial role in propagating the initial shock to macroeconomic activity. Indeed, banks in the euro area and beyond were hit by a sharp decline in bank profitability and an erosion of their capital cushions. At the same time, the financial crisis led to disruptions in banks' access to wholesale funding, their ability to securitise assets and put severe pressure on their liquidity positions. Overall, these developments imposed serious strains on banks' balance sheet position and consequently forced many banks to readjust their balance sheets and potentially impaired their ability to provide the non-financial private sector with funds for spending and investment.

Against this background, the focus of this paper is to identify the importance of bank balance sheet constraints in determining loan developments while at the same time controlling for the impact coming from the demand side and other factors affecting banks' lending behaviour, such as their overall risk perceptions and general macroeconomic conditions. With this aim in mind, using a panel econometric approach, this paper applies a unique confidential data set on banks' lending conditions, the ECB bank lending survey for the euro area (BLS). It offers the opportunity to test the importance of supply-side factors for developments in loans to non-financial corporations and households in the euro area. In addition, this rich data set enables us to exploit the more detailed replies in the bank lending survey regarding the factors contributing to changes in credit standards in order to disentangle not only loan supply and demand factors driving loan growth, but also the more specific factors underlying bank loan supply. Furthermore, using the survey's information on the "terms and conditions" by which credit standards are changed, we shed further light on euro area banks' lending behaviour and on how loan supply constraints are translated into tighter credit standards via either price or volume-related credit terms and conditions.

Focusing on the 2007-9 financial crisis, we finally evaluate the extent to which the crisis reinforced the importance of bank-specific supply-side effects on loan developments by testing for non-linearities of the observed supply-side effects. Again this part of the analysis distinguishes more specifically between the contributing factors of supply-side constraints as well as their translations into changes in price- and volume-related credit terms and conditions. Finally, in this regard, for the first time the paper additionally exploits empirically the information contained in the financial crisis-related "ad hoc" questions included in the consecutive rounds of the ECB bank lending survey since the third quarter of 2007.

Our findings suggest that during the sample period 2003-2009, even after controlling for various demand-side factors loan growth is negatively affected by "pure" supply-side constraints reflecting banks' balance sheet situations as well as by somewhat broader risk-related factors which comprise more cyclical effects such as changes in borrowers' risks and

changes in banks' risk aversion. This applies to both loans to households for house purchase and loans to non-financial corporations.

With respect to the terms and conditions by which banks alter their credit standards we find that both price effects (e.g. higher margins) and restrictions on the size of loans negatively affect the growth of corporate loans. The same applies to housing loans, whereas in this case margin adjustments tend to dominate volume effects (as e.g. collateral requirements and loan-to-value ratios). In any case, our results suggest that in terms of loan growth implications it matters not only by how much, but also how credit standards are changed.

For the 2007-9 financial crisis, we provide evidence that the impact of supply-side constraints, especially related to disruptions of banks' access to wholesale funding and their liquidity positions, was reinforced since the eruption of the financial crisis. This was also confirmed by banks' replies to a set of turmoil-related ad hoc questions where since the third quarter of 2007 the large majority of euro area banks reported that disruptions in their access to market funding and in their ability to transfer credit risk had significantly contributed to the net tightening of credit standards. In addition, our findings indicate that during the crisis, adjustments in banks' loan portfolios seem to have taken place primarily via prices rather than outright quantity restrictions.

The efforts of the ECB (and other central banks) during the financial crisis to help reignite the money and capital markets and to help alleviate the scarcity of liquidity should also be seen against the background of these findings. These efforts, in combination with the substantial recapitalisation of national banking sectors, have mitigated the strains on euro area banks' balance sheets and should enable them to start lending again once loan demand picks up.

1. Introduction

The financial crisis erupting in 2007 highlighted the crucial role played by the banking sector in propagating the initial shock to macroeconomic activity. Indeed, the headwinds hitting banks in the euro area and beyond have led to a sharp decline in bank profitability and eroded their capital cushions. Furthermore, the financial crisis led to disruptions in banks' access to wholesale funding, their ability to securitise assets and put severe pressure on their liquidity positions. Overall, these developments imposed serious strains on banks' balance sheet position and consequently forced many banks to readjust their balance sheets and potentially impaired their ability to provide the non-financial private sector with funds for spending and investment.² For instance, since last quarter of 2008 a substantial decline in the real annual growth rate of loans granted to euro area non-financial corporations has been observed. As in past episodes, the drop in the growth of loans has coincided with, and may largely have been caused by, the sharp deterioration of economic activity. However, owing to the unprecedented shocks hitting the financial sector during the 2007-9 financial crisis, it is likely that a supply-induced reduction of lending has likewise contributed to amplifying the downturn in the wider economy; as for example indicated by the significant tightening of banks' credit standards since mid-2007.

From a monetary policy perspective, it is important to know whether developments in aggregate loans to the non-financial private sector are driven by changes in the demand for loans or by changes in the supply of loans. Indeed, the tools and actions that monetary policy-makers may need to employ can differ substantially, depending on whether the central bank aims to affect the loan supply, loan demand or both. In addition, it is important to identify the underlying source of a shock to the supply of loans.

Against this background, the focus of this paper is to identify the importance of bank balance sheet constraints in determining loan developments while at the same time controlling for the impact coming from the demand side and other factors affecting banks' lending behaviour, such as their overall risk perceptions and general macroeconomic conditions. With this aim in mind, using a panel econometric approach, this paper applies a unique confidential data set on banks' lending conditions, the ECB bank lending survey for the euro area (BLS), which allows for testing the importance of supply-side factors in determining developments in loans to non-financial corporations and households in the euro area. We furthermore evaluate the extent to which the 2007-9 financial crisis reinforced the importance of bank-specific supply-

² Bank financing constitutes the most important source of external financing for households and non-financial corporations. Bank lending is a particularly important source of financing in the euro area, where bank loans have accounted for around 85% of the total external financing of the private sector in recent years. For further details on the importance of bank financing in the euro area financial system, see the articles entitled "The role of banks in the monetary policy transmission mechanism" and "The external financing of households and non-financial corporations" in the August 2008 and April 2009 issues, respectively, of the ECB Monthly Bulletin.

side effects on loan developments. The paper is structured as follows: Section 2 provides a survey of the literature disentangling loan supply and demand. In Section 3, the data are presented and the empirical methodology is described in Section 4. Section 5 provides the results, while Section 6 concludes.

2. Related literature and this paper's contribution

The existence of frictions in financial markets, such as asymmetries of information and incompleteness of financial contracts, imply that lenders will not always be willing to, or able to, finance projects with positive net present value. In such cases, the net worth of the borrower and/or the lender is of crucial importance for loan supply, and for the ability of monetary policy to affect the provision of credit (see e.g. Bernanke and Blinder, 1988; Bernanke and Gertler, 1995; Bernanke, Blinder and Gilchrist, 1999; Diamond and Rajan, 2006).

In general, however, it is difficult to identify the supply and demand effects that underlie credit developments, especially as shifts in demand and supply often occur simultaneously. They both have an impact on bank lending rates and credit volumes which depending on the situation may pull in the same direction. Empirically, it is therefore challenging to identify supply effects using aggregate time series. For that reason, individual bank-specific characteristics are often used in the empirical literature to identify factors that directly influence the supply of loans, while demand for loans is typically assumed to be independent of the situation of individual banks and to rather depend on macroeconomic factors (e.g. Peek and Rosengren, 1995; Kashyap and Stein, 2000; Ashcraft, 2003; Chatelain et al., 2003; Ehrmann et al., 2003; Gambacorta and Mistrulli, 2004; Kishan and Opiela, 2000 and 2006; Ashcraft and Campello, 2007; Den Haan et al., 2009; Altunbas et al., 2009; Jiménez et al., 2010). In addition to using such micro-based evidence, cross-country panel econometric approaches have been used by exploiting the cross-section variation to identify the importance of shocks to loan supply in explaining loan developments (e.g. Driscoll, 2004; Cihak and Brooks, 2008; and Cappiello et al., 2010).

In this paper, we also make use of a country-panel econometric approach. However, in contrast to the previous studies (cited above), we furthermore make extensive use of the responses to the ECB bank lending survey for the euro area, which include information on euro area banks' assessments of loan supply and demand conditions and which thus allows for a potential identification of supply-side effects also at the more aggregate euro area level.

Not only does the bank lending survey distinguish between loan demand and loan supply (the latter being broadly reflected in the reported changes in credit standards), it also contains

detailed information about the underlying factors related to banks' decision to supply credit and to the related changes in their credit terms and conditions for their customers.

A few recent (mainly US-based) studies have applied the information contained in the bank lending survey (in the case of the US, in the Senior Loan Officer Opinion Survey) to study the impact on loan growth, financing conditions more generally and on economic activity (see e.g.; Lown and Morgan, 2006; Bayoumi and Melander, 2008; Maddaloni and Peydró, 2009; De Bondt et al., 2010). In the same vein, a few studies have incorporated survey-based information on bank credit standards into Financial Conditions Indices (FCI, see e.g. Swiston, 2008; Guichard et al., 2009; Hatzius et al., 2010). Berger and Udell (2004) applied bank-level information of US banks' lending standards in a study providing evidence of myopic behaviour of bank loan officers as an explanation for the observed pro-cyclicality of bank lending. Also using a micro data set, Hempell (2007a-b) exploited the Eurosystem bank lending survey. Using factor analysis, she identified the main common drivers behind euro area banks' credit standards and loan demand (as perceived by the banks).

More recently, Ciccarelli et al. (2010) applied a panel VAR approach using country-level information from the bank lending survey to assess the macroeconomic impact of changes in credit standards, while distinguishing between loan supply and demand factors. Del Giovane et al. (2010) combine micro data on loan prices with information on credit standards from the Italian banks participating in the bank lending survey to provide an assessment of the relative importance of loan supply and demand factors during the period of credit contraction in 2008-9. Likewise, Bassett et al. (2010) exploit bank level data from the US Senior Loan Officer Opinion Survey to derive "unexplained changes" in bank lending standards, which the authors interpret as pure supply-side effects. Using, in turn, a VAR-X approach Bassett et al. (2010) find that such loan supply shocks have significant economic effects on real GDP and core lending capacity.

This paper adds to the literature in the following ways: First, using a panel econometric approach we exploit the more detailed replies in the bank lending survey regarding the factors contributing to changes in credit standards in order to disentangle not only loan supply and demand factors driving loan growth, but also the more specific factors underlying bank loan supply. Second, using the survey's information on the "terms and conditions" by which credit standards are changed we shed further light on euro area banks' lending behaviour and on how, for example, loan supply constraints are translated into tighter credit standards via either price or non-price terms and conditions. Third, we analyse the extent to which the eruption on the financial crisis in 2007 had implications for the importance of supply-side factors for provision of loans to non-financial corporations and households in the euro area. In this regard, we are also the first to empirically exploit the information contained in the financial crisis-related "ad hoc" questions included in the consecutive rounds of the ECB bank lending survey since the third quarter of 2007.

3. The data

In order to identify supply constraints on banks' lending activity it is crucial to try to disentangle demand and supply-side related determinants of overall lending. The data source key to our endeavour in this direction is information from the Eurosystem's Bank Lending Survey (BLS, henceforth) for the euro area which was introduced in 2003 and is conducted at a quarterly frequency.³ These data – although qualitative by nature – could be characterized as the best information available on changes in the supply of bank loans in the euro area.⁴

In the survey, reporting banks reply to a set of questions on the credit standards that they apply to loans to enterprises (including both small and large enterprises) and to households (loans for house purchase and consumer credit, respectively). Apart from the general questions on the extent to which banks have changed their credit standards in comparison with the previous quarter and how they expect to change them in the next quarter, the survey also includes questions related to the factors that contribute to changes in the standards, such as banks' risk perception, bank balance sheet constraints and competitive conditions. Banks are also asked to report on the way they change their credit standards, the “terms and conditions” in other words. These “terms and conditions range from price-related terms (e.g. margins on loans), to volume-related terms (size of loans, collateral requirements) and other terms (such as maturity, loan covenants, etc.). In addition, banks are asked to report how they perceive the demand for loans (from enterprises and households respectively) to have developed in the previous quarter. Furthermore, non-standard questions are occasionally included in the survey on an ad hoc basis, with the aim of covering specific (structural and cyclical) developments in euro area credit markets that are not captured by the standard questionnaire.⁵ The qualitative replies are aggregated to net percentages which are calculated as the difference between the sum of the percentages of banks replying to have “tightened considerably” and “tightened somewhat” and the sum of the percentages of banks reporting to have “eased somewhat” and “eased considerably”.⁶

In 2009, the sample consisted of 118 reporting banks covering the 16 euro area countries;⁷ however, for our empirical assessment we include 11 of the 12 countries participating since

³ Similar surveys were already conducted by the Federal Reserve (Senior Loan Officer Opinion Survey) and the Bank of Japan. More recently, bank lending surveys have also been introduced by other central banks within the EU.

⁴ For general information on the BLS see Berg, Van Rixtel, Ferrando, de Bondt, and Scopel (2005).

⁵ For instance, various ad hoc questions concerning the impact of the financial crisis on bank lending conditions have been included since the October 2007 survey round (see Section 5.2.2 for more details and Tab. 1c) for some descriptive statistics).

⁶ Similarly, for questions related to loan demand, net percentages are calculated as the difference between the sum of the percentages for “increased considerably” and “increased somewhat” and the sum of the percentages for “decreased somewhat” and “decreased considerably”.

⁷ Owing to mergers and other structural changes in the national banking sectors, the sample of banks has changed since the inception of the survey in 2003. The entry of new euro area countries has also led to an increase in the number of reporting banks over the years.

the start of the survey.⁸ The sample banks are selected in such a way as to produce a fair representation of the euro area banking sector, taking into account differences in the banking structures across countries. Overall, the surveyed banks cover around half of all the loans granted by Monetary Financial Institutions (MFIs) to the non-financial private sector in the euro area. The sample covers the period from the beginning of the survey in early 2003 referring to the fourth quarter 2002 up until the January 2010 survey round referring to the fourth quarter of 2009.

Evidently, for an empirical analysis the BLS data set is limited by the relatively short time horizon. To somewhat circumvent this limitation, we take advantage of the cross-country variations as the macroeconomic environment in the different national economies varies substantially and follows different cycles. First of all, we include at the country level the quarterly growth rate of loans by MFIs to non-financial corporations and to households for house purchase, respectively, as the dependent variables. Furthermore, changes in the logarithm of real GDP, the 10-year government bond rate, inflation (HICP) and the change in the logarithm of nominal housing prices for loans to non-financial corporations and housing loans, respectively, enter as country-specific explanatory variables. Moreover, we include the overnight rates (EONIA) for the euro area. (For detailed descriptive statistics on the variables employed see Tables 1a) –b).)

4. Empirical approach

Taking advantage of these cross-country differences, within a panel framework, we analyse the development of loans to non-financial corporations and housing loans to private households with respect to key macroeconomic variables and additional information taken from the BLS, which helps overcoming the problem of identifying loan supply and demand. Furthermore, the survey information allows for a closer distinction of specific supply-side factors of lending beyond the mere inclusion of changes in credit standards as rough proxies for changes in banks' loan supply.

More precisely, we use information on the impact of “banks' cost of capital”, their “access to market funding” as well as their “liquidity position” on the tightening of credit standards for loans to non-financial corporations. For housing loans, by contrast, only one aggregate variable on “banks' cost of funds and balance sheet constraints” is available. The impact of these variables on lending, we consider to be “pure supply-side” effects. Moreover, the survey provides more detailed information on risk-related factors; that is on how “expectations of economic activity” and “firm or industry-specific outlook” for corporate loans or “housing market prospects” for housing loans affect the tightening of their credit standards applied to the respective loan categories. These risk related factors, however, do not distinguish between

⁸ We exclude Luxembourg due to loan data there being determined to a high degree by non-domestic factors.



the mere changes in expected credit risk – which we would rather view as demand side determinant – and changes in banks’ risk aversion – which can clearly be considered a supply side determinant. Accordingly, these risk factors should only in part proxy banks’ risk related supply side behaviour.

In addition, we consider how the actual implementation of changes in credit standards via changes in banks’ lending terms and conditions impacts on loan growth. This is of particular interest as this analysis can shed some light on the relative importance of price vs. quantity restrictions; i.e. whether changes in the growth of loans are particularly driven by changes in the interest margins or more quantitative conditions such as for instance collateral requirements or outright quantity restrictions.

Applying a feasible general least squares (FGLS) estimator to our panel data set correcting for panel specific autocorrelations, cross sectional correlations as well as heteroscedasticity, we employ the following estimation specification⁹ to explain the quarterly growth rate of loans to non-financial corporations using for the supply side BLS information related to

(a) overall changes in credit standards (*BLScreditstds*):

$$\begin{aligned} \Delta loans_{i,t} = & \alpha + \beta_0 \Delta \ln GDP_{i,t-1} + \beta_1 gov.b.yield_{i,t-2} + \beta_2 \Delta HICP_{i,t-4} + \beta_3 EONIA_{t-1} \\ & + \gamma_0 BLSdemand_{i,t-2} + \gamma_1 BLScreditstds_{i,t-3} + countrydum_i + \sum_{k=1}^3 \rho_k seasonal dum_k + \varepsilon_{i,t} \end{aligned}$$

(b) factors contributing to the changes in credit standards (*BLSconstrfactor*, *BLSriskfactor*):

$$\begin{aligned} \Delta loans_{i,t} = & \alpha + \beta_0 \Delta \ln GDP_{i,t-1} + \beta_1 gov.b.yield_{i,t-2} + \beta_2 \Delta HICP_{i,t-4} + \beta_3 EONIA_{t-1} \\ & + \gamma_0 BLSdemand_{i,t-2} + \gamma_1 BLSconstrfactor_{i,t-3} + \gamma_2 BLSriskfactor_{i,t-2} \\ & + countrydum_i + \sum_{k=1}^3 \rho_k seasonal dum_k + \varepsilon_{i,t} \end{aligned}$$

(c) changes in terms and conditions (*BLSmargin*, *BLSvolume*) reflecting the changes in credit standards:

$$\begin{aligned} \Delta loans_{i,t} = & \alpha + \beta_0 \Delta \ln GDP_{i,t-1} + \beta_1 gov.b.yield_{i,t-2} + \beta_2 \Delta HICP_{i,t-4} + \beta_3 EONIA_{t-1} \\ & + \gamma_0 BLSdemand_{i,t-2} + \gamma_1 BLSmargin_{i,t-1} + \gamma_2 BLSvolume_{i,t-1} \\ & + countrydum_i + \sum_{k=1}^3 \rho_k seasonal dum_k + \varepsilon_{i,t} \end{aligned}$$

⁹ The lag structure of the explanatory variables is chosen upon the highest significance when applying a general-to-specific approach and held constant for the general specification across alternative supply-side BLS variables.

For housing loans instead of inflation, $\Delta HICP$, the growth rate in residential property prices is included, $\Delta \ln houseprices$.

To check for the robustness of the results obtained by the static FGLS estimator, which does not account for potential persistence in loan growth over time, we additionally apply a dynamic panel approach including a lagged dependent variable. However, the inclusion of a lagged dependent variable generally yields biased and inconsistent estimates due to the correlation between the lagged dependent variables and the error terms (see Nickel (1981) and Kiviet (1995)). Standard dynamic panel data models using GMM (General Method of Moments; e.g. Arellano and Bond (1991) and related approaches) to address this problem are unfortunately only asymptotically efficient and have poor finite sample properties, i.e. they are not suitable for small samples as the one used in this analysis.

Kiviet (1995), Judson and Owen (1999) and Bun and Kiviet (2001) have investigated the biases introduced by different dynamic panel estimators using Monte Carlo experiments; their analyses suggest the use of a bias corrected least-squares-dummy-variable (LSDVC) estimator as developed by Kiviet (1995) and extended upon by Bun and Kiviet (2003) and Bruno (2005a,b) which allows for a lagged endogenous variable despite a small cross-section of the sample. Accordingly, we use this approach as implemented by Bruno (2005b) to cross check our empirical findings.¹⁰ As in small samples the estimated asymptotic standard errors for this bias corrected dynamic within estimator may yield unreliable t-statistics, statistical inference for the coefficients is based on bootstrapped standard errors (50 iterations) (see also Bruno, 2005b).

5. Results

5.1 Overall sample period

In the first part of our empirical analysis we consider the entire sample period ranging from the fourth quarter of 2002 to the fourth quarter of 2009, without distinguishing between sub-periods. We analyse first to what extent changes in overall credit standards on loans to firms and households, respectively, help explain loan growth in the euro area. Second, we run the same set of regression, however, focusing on the explanatory strength of the underlying factors contributing to changes in overall credit standards. This allows disentangling “pure” loan supply effects stemming from constraints to banks’ own balance sheet conditions from more business-cycle related factors stemming from borrower riskiness and loan demand. Third, we investigate how banks change their credit standards with the aim of detecting

¹⁰ We initialize the bias correction with the Arellano-Bond estimator.

whether, for example, price effects dominate volume effects in terms of explaining loan growth.

5.1.1 Regressions based on overall changes in credit standards and contributing factors

Loans to non-financial corporations: Turning first to the regressions for non-financial corporate loan growth (Table 2a for the FGLS-based estimates and Table 2c for the LSDVC-based estimates), we observe that when including the overall changes in credit standards (column 1) a net tightening of credit standards is found to exert a significant negative impact on loan growth after three quarters. The effect is statistically significant despite controlling for changes in loan demand and broad macroeconomic developments. As expected, higher loan demand implies stronger loan growth in subsequent quarters, while also real GDP growth and inflation affect lending positively.

When introducing, in turn, the three underlying contributing factors related to banks' own balance sheet situation (i.e. the cost of capital, access to wholesale funding and the liquidity position), we similarly find a significant negative impact from all three factors (columns (2)-(4)). The effect is qualitatively strongest with respect to costs related to banks' capital position. This is furthermore confirmed when including the three factors simultaneously (column (5)). In this case, only the coefficient related to the capital position remains significant. Inclusion of the variables indicating the banks' risk perception (expectations to general economic activity and firm and industry-specific outlook, respectively) are found to improve the fit and both variables have the expected negative coefficients. Finally, in column 9 it is observed that both capital constraints and banks' risk perceptions exert a significant negative influence on loan growth. With respect to the risk-based factors, in the robust estimator approach (Table 2c) only the variable related to the firm and industry-specific outlook is found to be significant.

As regards their economic significance, the estimates suggest that a 10 percentage point increase in the factor "banks' cost of capital position" contributing to a tightening of credit standards would roughly result in a 0.1 to 0.2 percentage point decline in the quarterly growth rate of loans to non-financial corporations. At the same time, a 10 percentage point increase in the factor "firm and industry-specific risk" would render a 0.1 percentage point decrease.

Loans to households for house purchase: A similar set of results are found when looking at the loan growth regressions for loans to households for house purchase (Table 2a for the FGLS-based estimates and Table 2c for the LSDVC-based estimates). The coefficient on contemporaneous changes in overall credit standards (column 1) is again negative, although only significantly so in the case of the FGLS-based approach. Likewise, we find negative coefficients on the contributing factors related to banks' costs of funds and balance sheet

constraints, expectations to general economic activity and housing market prospects, respectively. However, for the latter two factors coefficients are significant only under the FGLS approach but not when doing the robustness LSDVC-based regression. It is furthermore notable that when including simultaneously the bank balance sheet constraint factor and either of the risk-related factors, only the former remains statistically significant. Finally, the coefficients on the housing loan demand indicator and the broad macroeconomic variables all have the expected signs.

As regards their economic significance, the estimates suggest that a 10 percentage point increase in the factor “banks’ cost funds and balance sheet constraints” contributing to a tightening of credit standards would again roughly result in a 0.2 percentage point decline in the quarterly growth rate of loans to non-financial corporations.

Finally, the impact of loan demand as proxied by the respective BLS questions is highly statistically significant for both loan categories and also robust to the alternative estimation approaches applied. Apart from the impact of the other macro variables included and to a large extent attributable to the demand-side of loan developments, our estimates suggest that an additional 10 percentage point decrease in this variable results in a decline of the respective quarterly growth rates of around 0.1 percentage point for corporate loans and 0.2 for housing loans.

5.1.2 Regressions based on overall changes in terms and conditions

An important question when assessing loan supply restrictions is how banks actually implement them. In other words, in the face of supply-side constraints do banks tighten credit standards via loan pricing or via volume restrictions as for instance tighter collateral requirements and outright quantity restrictions? To shed light on this issue, we next analyse how the different terms and conditions through which credit standards are changed affect loan growth.

Loans to non-financial corporations: In Table 2b for the FGLS approach and Table 2d for the LSDVC approach, we present the results of the regressions on non-financial corporate loan growth when including different types of terms and conditions applied by banks when changing their credit standards. We do indeed find that increases in margins on both average and riskier loans tend to lead to a decline in loan growth in subsequent quarters. Likewise, introducing restrictions on the size of loans and credit lines offered by banks to their borrowers has a significant negative impact on loan growth. In terms of economic significance, restrictions on loan size are found to have a relatively stronger impact. This is also reflected by the fact that (using the LSDVC approach in Table 2d) when including all

three types of terms and conditions only conditions regarding size of loans remain significant at the 10% confidence level (see column (4)).

Loans to households for house purchase: Similarly, when including variables related to terms and conditions in the regressions on the growth of loans to households for house purchase we find higher margins, higher loan-to-value ratios as well as more stringent requirements on collateral to have a negative impact on housing loan growth (see Tables 3b and 3d). The effects appear qualitatively most important as regards margins on riskier loans. Moreover, when including simultaneously different types of terms and conditions in the regression, the margins on riskier loans tend to dominate.¹¹ In this sense lending for house purchase differs from lending to corporations where loan size effects were found to be predominant. This might owe to the fact that housing loans are typically well-collateralised and hence the marginal impact on lending from changing collateral requirements and loan-to-value ratios may be limited compared to changes in the pricing of loans, especially vis-à-vis the marginal (i.e. riskier) borrowers.

5.2 Focusing on the financial crisis

The financial crisis which erupted in the second half of 2007 led to severe losses for the euro area banking sector and forced many banks to replenish their capital buffers and clean up their balance sheets. At the same time, it put substantial strains on banks' access to funding and their liquidity positions. The crisis, thereby, had a major impact on the central parameters of the supply side in bank lending. To further detect whether the financial crisis impacted on euro area banks' ability to supply loans, in Section 5.2.1 we repeat the regression analysis described above, however now distinguishing between the crisis period (i.e. Q3 2007-Q4 2009) and the pre-crisis period. Furthermore, in Section 5.2.2, we exploit the information contained in specific crisis-related questions included in the Eurosystem bank lending survey since Q3 2007, referring in particular to difficulties in accessing wholesale funding and its impact on banks' lending behaviour.

5.2.1 Comparing crisis and pre-crisis bank lending

To assess whether this impact can also be traced empirically despite the limited amount of observations available for the turmoil period, we employ the empirical approach described in section 4 addressing different supply-side factors determining bank lending to non-financial corporations and households as a benchmark. In order to identify potential changes in the empirical relevance of the different factors before and during the crisis period, we interact

¹¹ Indeed, in the robustness LSDVC regressions, "margins on riskier loans" is the only variable which remains statistically significant when combining different types of terms and conditions (see Table 3d, columns (3), (6) and (7)).

these factors subsequently with a “crisis” dummy and a “non-crisis” dummy, which differentiates the period before and since 2007 Q3.

Loans to non-financial corporations: As displayed in Tables 4a, 4d and 8a, for bank lending to non-financial corporations the impact of factors contributing to a tightening of lending standards seems to have increased during the crisis. This is indicated by higher coefficients for the turmoil period and applies both to the overall credit standards and to the variables for the contributing factors to changes in credit standards. For example, the crisis-specific coefficient on overall credit standards on loans to non-financial corporations (column 1) is -0.22 compared with a coefficient of -0.12 in the pre-crisis period. Moreover, in the FGLS approach reported in Table 4a the difference between the crisis and pre-crisis period is statistically significant (see Table 8a). Hence, this would suggest that changes in credit standards overall became more important drivers of corporate loan growth during the crisis.

More specifically, for “banks’ cost of capital” both interacted variables for the crisis and non-crisis period are statistically significant, although qualitatively higher for the crisis period. By contrast, for “access to market financing” and “banks’ liquidity position”, the variables turn out to be insignificant for the non-crisis period. This could serve as an indication, that banks’ liquidity conditions and access to wholesale funding had no, or very limited, relevance for bank lending to non-financial corporations in the pre-crisis period and was, by contrast, highly relevant for banks in the crisis period. This is particularly noteworthy, as the non-standard measures undertaken by the ECB already mitigated to a large extent the liquidity constraints of banks in the euro area. Finally, borrowers’ risk as reflected by the industry or firm-specific outlook is significant in both periods albeit the coefficient is higher for the crisis period. The finding of more pronounced “pure” supply-side effects during the crisis period remains also when including variables controlling for banks’ risk perception. The Wald tests of differences between the crisis and the pre-crisis period coefficients are all statistically significant under the FGLS approach, whereas this is the case only to a much lesser extent under the LSDVC approach. In the latter case (see Table 4c and Table 8a), among the factors relating to banks’ own situation only the factor referring to their liquidity situation remains statistically significantly (at the 10% level) different between the two sub-periods. Statistically significant different coefficients are also found for the risk perception factors (i.e. firm and industry-specific outlook and expectations to the general economic outlook), also when applying the LSDVC approach.

In sum, despite the short sample available for the crisis period, we find for all factors, except for the access to market financing¹², the interacted crisis variables to be statistically significant pointing to supply-side factors having had a special impact during the crisis period, particularly when considering the substantially higher values observed for these variables

¹² Here, the significance was not robust to the application of the alternative LSDVC estimator (see Table 5c).

during this period. Moreover, the size of the coefficients has been larger for all five factors during the crisis period, albeit statistically significantly only for banks' liquidity positions and risk related factors. This lack of significance might, however, owe to some extent to the very small number of observations available for this sub-period.

In Table 4b we report the results for the corporate loan regressions (based on the FGLS approach) including variables on the changes in different terms and conditions and distinguishing between the crisis and pre-crisis period.¹³ It is notable that the estimated coefficients on "margins on average loans" and on "restrictions on size of loans" are substantially larger for the crisis period than in the pre-crisis period, while no major differences are observed with respect to "margins on riskier loans". Contrary however to the findings when looking at the overall sample period where quantity restrictions were found to be predominant in terms of loan growth impact (see Section 5.1.2 above), our evidence suggests that during the crisis changes in margins on average loans had a predominant effect on loan growth. First, in terms of difference with the pre-crisis period, average margins are the only type of "terms and conditions" which is statistically significantly different at the 1%-level.¹⁴ Second, when including all three variables simultaneously (column 8 in Tables 4b and 4d) the "crisis" coefficient on the "average margin" variable is the largest and most significant, especially under the LSDVC approach. This might suggest that during crises, as uncertainty increases, banks' perception of risk becomes blurred and hence they may tend to discriminate less (in terms of the margins offered) between different types of borrowers. At the same time, turmoil related pressures to reduce banks' balance sheets in size led to a general deleveraging process among banks.

Loans to households for house purchase: Also, for bank lending to households for house purchase the impact of overall credit standards and particularly the factors contributing to a tightening of credit standards seems to have changed during the crisis, as displayed in Table 4a. Moreover, the difference in coefficients is statistically significant, especially so with respect to the risk perception variables (expectations to general economic activity and housing market prospects, respectively) – see Table 8b.¹⁵ Thus, whereas banks' own balance sheet constraints do seem to have impacted negatively on housing-related loan growth during the financial crisis, the main influence on banks' decisions to supply housing loans seems to have been cyclical factors related to banks' risk perceptions. The findings also seem to support the notion that up until the beginning of the crisis risk-related factors have played only a minor role for housing loans in the euro area as a whole. In contrast, our results indicate that the borrowers' balance-sheet position (that is, the value of their house and thereby their collateral)

¹³ Results based on the LSDV approach are presented in Table 4d.

¹⁴ This holds for both the FGLS approach and the LSDVC approach (see Table 4d and Table 8a).

¹⁵ This is even more pronounced when looking at the robustness estimates of the LSDVC approach in Table 5c.

has substantially gained in relevance for housing loans during the crisis with housing markets plummeting in several member states.

Overall, there are strong indications for supply-side factors to have gained in importance for lending to private households for house purchase in the crisis period, while they seem to have been rather negligible in the pre-crisis period.

Turning to the housing loan regressions including terms and conditions variables and distinguishing between the crisis and pre-crisis period, we find that higher margins and more stringent collateral requirements exerted a higher impact on loan growth during the crisis period than prior to the outbreak of the crisis (see Tables 5b and 5d). As for the non-financial corporate loans, the difference between the two sub-periods was most pronounced with regard to margins on average loans, which again might be an indication that banks discriminate less between more or less risky borrowers during crises when uncertainty is high and where banks potentially pay more attention to their own balance sheet situation when granting loans. In addition, the impact of pressure to reduce their balance sheets might additionally have contributed to a less discriminatory reduction in loan volumes.

5.2.2 Supplementary survey evidence for supply-side constraints during the crisis period

An additional path to trace the impact of supply-side constraints on bank lending during the crisis period is offered by information from the BLS on supplementary turmoil-related “ad hoc”-questions. In order to gauge in more detail the impact of the financial market turmoil experienced since mid-2007 on euro area banks, the bank lending survey was augmented by several “ad hoc” questions. Particularly as regards banks’ market access to wholesale funding, these questions address in considerable detail the potential impact of the turmoil on banks’ lending decisions in terms of quantities and prices. This information has served as supplementary evidence to the results obtained from the regular questions – particularly those on the factors contributing to a tightening of credit standards. Adding the information derived from the “ad hoc” questions as explanatory variables to the empirical model described in Section 2 can add further insight as to how the impact of supply-side constraints changed during the financial crisis. In the following, we first briefly describe the aggregate results on these “ad hoc” questions and then summarize our empirical findings for lending to non-financial enterprises as well as to private households for house purchase.

In the ad hoc questions regarding access to market funding, between Q3 2007 and Q2 2010 to varying degrees euro area banks reported particular difficulties in transferring credit risk and securitising loans, as well as in refinancing themselves by issuing medium to long-term debt securities. For most of the affected banks, the impact on their lending activity was reflected in margins, as well as in quantities. However, the impact on loan margins of hampered access to money markets, debt securities and other markets overall was stronger than that on the

lending volume supplied. At the same time, hampered access to securitisation seems to have impacted equally on the prices and volumes of loans extended, according to the responses of banks participating in the survey.

Against this background, to further assess the impact of supply-side constraints on bank lending during the crisis period, we therefore include this supplementary information from the BLS ad hoc questions on the impact of banks' market access to wholesale funding on bank lending at the country level as additional explanatory variables in our empirical model. The results are presented in Tables 6a-b for loans to non-financial corporations and in Tables 6a-b for loans to households for house purchase. The results obtained from these regressions are of course conditioned on the particularly short time period for which information on the wholesale funding situation is available, starting only in the third quarter of 2007, and further complicated by the lag structure of three to four quarters which turned out to be the most significant ones.¹⁶ Moreover, as already discussed in section 5.2.1, there are strong indications for a change in relationships particularly as regards supply-side factors during the crisis which have to be born in mind when interpreting the results.

Loans to non-financial corporations: Turning first to the FGLS regression of loans to non-financial corporations (see Table 6a), we find indications that hampered access to all wholesale market segments have put a strain on banks' lending activity. This result, however, is qualified by the fact that these findings are not robust when using the Least Squares Dummy Variables Corrected estimator and might therefore only serve as first indication. Moreover, as regards the extent to which the influence of the hampered wholesale market access on banks' lending has worked either through loan quantities or through the prices offered on the loans, our results point to price rather than volume effects. This particularly seems to hold for the impact of hampered access to securitisation markets on banks' pricing of loans. In this case, the impact of hampered access to debt securities markets and securitisation on prices was also robust when employing the LSDVC estimator (see Table 6b). The latter finding of a more pronounced effect on lending through more restrictive pricing rather than through outright quantity restrictions thus are consistent with the results obtained when including "terms and conditions" variables (see Tables 4b and 4d).

Loans to households for house purchase: For loans to private households for house purchase (see Tables 7a-b), our findings suggest that hampered access to all wholesale market segments included in the ad hoc questions had a constraining impact on lending. The findings were not only highly significant for the results using the FGLS estimator, but also significant when employing the LSDVC estimator. In the latter case, however, the coefficients on the overall change in credit standards applied to housing loans become non-significant, which might

¹⁶ This actually results in a sub-sample period of only six to seven quarters of observations for the variables related to the ad hoc questions as opposed to 26 quarters for the entire sample period as for instance in the case of loans to non-financial corporations.

suggest that for what concerns housing loan developments overall changes in credit standards only had explanatory power during the financial crisis (as also indicated by the results discussed in Section 5.2.1). Furthermore, the results indicate these effects to have not only had an impact on the pricing but also on the quantities of housing loans offered.

6. Conclusions

Applying a cross-country panel-econometric approach using a unique confidential data set on results from the Eurosystem's bank lending survey (BLS), which allows for disentangling loan supply and demand effects, this paper has provided evidence that factors related to banks' balance sheet positions have a significant influence on the growth of loans to firms and households in the euro area. With respect to the terms and conditions by which banks alter their credit standards, we find that both price effects (e.g. higher margins on riskier loans) and restrictions on the size of loans negatively affect the growth of corporate loans. The same applies for housing loans, whereas in this case margin adjustments tend to dominate volume effects (as e.g. collateral requirements and loan-to-value ratios). In any case, our results suggest that in terms of loan growth implications it matters not only by how much, but also which conditions of credit standards are changed.

Focusing on the 2007-9 financial crisis, in the second part of the paper, our empirical findings suggest that strains on banks' liquidity positions and their access to market financing contributed significantly to the slowdown in corporate lending, whereas such effects were not significant prior to the crisis. This is particularly noteworthy, as the non-standard measures undertaken by the ECB already mitigated to a large extent the liquidity constraints of banks in the euro area. In addition, coefficients on factors contributing to a tightening of credit standards were systematically higher for the crisis period. It is also noticeable that with respect to terms and conditions predominantly "margins on average loans" and to a more limited degree "restrictions on the size of loans" significantly affected loan growth during the crisis, but less so prior to the crisis. By contrast, "margins on riskier loans" were more important in the pre-crisis period. Similar findings broadly apply to housing loans. Both indicate that during the crisis, adjustments in banks' loan portfolios seem to have been geared primarily via prices rather than outright quantity restrictions.

In sum, although overall loan developments in the euro area appear to have been mainly driven by cyclical and demand-side factors, these findings suggest that the financial turmoil-induced shock to the banking sector significantly impaired euro area banks' ability to supply loans. This was also confirmed by banks' replies to a set of turmoil-related *ad hoc* questions included in the consecutive rounds of the ECB bank lending survey since the third quarter of 2007 where the large majority of euro area banks reported that disruptions in their access to

market funding and in their ability to transfer credit risk had significantly contributed to the net tightening of credit standards.

Overall, our findings hence provide support for the “non-standard” policy measures taken by the ECB since the outbreak of the crisis. At the same time, they suggest that these measures in combination with the substantial recapitalisation of national banking sectors, should have mitigated the strains on euro area banks’ balance sheets and enabled them to start lending again once loan demand picks up.

References

- Altunbas Y., de Bondt, G. and Marqués Ibáñez, D. (2004), “Bank Capital, Bank Lending and Monetary Policy in the euro area”, *Kredit und Kapital*, Vol. 4, pp. 443-465.
- Altunbas Y., Gambacorta, L. and Marqués Ibáñez, D. (2009), “Securitisation and the Bank Lending Channel”, *European Economic Review* (forthcoming) and ECB Working Paper Series, No. 838.
- Arellano, M. and Bond, S. (1991), “Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations”, *Review of Economic Studies*, 58, 277-97.
- Ashcraft, A. (2003), “New evidence on the lending channel”, *Journal of Money, Credit, and Banking*, Vol. 38(3), pp. 751-776.
- Ashcraft, A. and Campello, M. (2007), “Firm balance sheets and monetary policy transmission”, *Journal of Monetary Economics*, Vol. 54, pp. 1515-1528.
- Bassett, W.F., Chosak, M.E., Driscoll, J.C. and Zakrajsek, E. (2010), “Identifying the macroeconomic effects of bank lending supply shocks”, Federal Reserve Board of Governors, working paper.
- Bayoumi, T. and Melander, O. (2008), “Credit Matters: Empirical evidence on US macro-financial linkages”, IMF Working Paper No. 08/169.
- Berg, J., Van Rixtel, A., Ferrando, A., de Bondt, G. and Scopel, S. (2005): “The bank lending survey for the euro area”, ECB occasional paper, no. 23.
- Berger, A.N. and Udell, G.F. (2004), “The institutional memory hypothesis and the procyclicality of bank lending”, *Journal of Financial Intermediation*, Vol. 13(4), pp. 458-495.
- Bernanke, B.S. and Blinder, A. (1988), “Credit, money, and aggregate demand”, *American Economic Review*, Vol. 78, No. 2, May, pp. 901-921.
- Bernanke, B.S. and Gertler, M. (1995), „Inside the black box: the credit channel of monetary policy transmission”, *Journal of Economic Perspectives*, Vol. 9, No. 4, Autumn, pp. 27-48.
- Bernanke, B.S., Gertler, M. and Gilchrist, S. (1999), „The financial accelerator in a quantitative business cycle framework”, in Taylor, J. and Woodford, M. (eds.), *Handbook of Macroeconomics*, Amsterdam.
- Borio, C. and Zhu, H. (2008), “Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism”, BIS Working Paper Series, No 268.
- Bruno, G.S.F. (2005a), “Approximating the Bias of the LSDV Estimator for Dynamic Unbalanced Panel Data Models”, *Economic Letters*, Vol. 87, pp. 361-366.
- Bruno, G.S.F. (2005b), “Estimation and Inference in Dynamic Unbalanced Panel Data Models with a Small Number of Individuals”, *The Stata Journal*, 5, 473-500.

- Bun, M. and Kiviet, J. (2003), “On the Diminishing Returns of Higher Order Terms in Asymptotic Expansions of Bias”, *Economics Letters*, Vol. 79, pp. 145-152.
- Cappiello, L., Kadareja, A. Kok Sørensen, C. and Protopapa, M. (2010), “Do bank loans and credit standards have an effect on output? A panel approach for the euro area”, ECB Working Paper Series No. 1150.
- Chatelain, J.B, Ehrmann, M., Generale, A., Martínez-Pagés, J, Vermeulen, P. and Worms, A. (2003), “Monetary Policy Transmission in The Euro Area: New Evidence from Micro Data on Firms and Banks”, *Journal of the European Economic Association*, Vol. 1, No. 2-3, 731–742.
- Ciccarelli, M., Maddaloni, A. and Peydró, J.L. (2010), “Trusting the Bankers: a New Look at the Credit Channel of Monetary Transmission,” ECB Working Paper Series No. 1228.
- Cihák, M. and Brooks, P.K. (2008), “From subprime loans to subprime growth? Evidence for the euro area”, IMF Working Paper Series, No 09/69.
- De Bondt, G., Maddaloni, A., Peydró, J.L., and Scopel, S. (2010), “The bank lending survey matters: Empirical evidence for credit and output growth”, ECB Working Paper Series No. 1160.
- Del Giovane, P., Eramo, G. and Nobile, A. (2010), “Disentangling demand and supply effects in credit developments: A survey-based analysis for Italy”, Banca d’Italia Temi di Discussione (forthcoming).
- Den Haan, W.J., Sumner, S. and Yamashiro, G. (2009), “Bank Loan Portfolios and the Monetary Transmission Mechanism”, *Journal of Monetary Economics*, forthcoming.
- Diamond, D.W. and Rajan, R.G. (2006), “Money in a theory of banking”, *American Economic Review*, Vol. 96, pp. 30-53.
- Driscoll, J.C. (2004), “Does bank lending affect output? Evidence from the U.S. states”, *Journal of Monetary Economics*, Vol. 51, pp. 451-71.
- ECB (2008), “The role of banks in the monetary policy transmission mechanism”, Monthly Bulletin, August, pp. 85-98.
- Ehrmann, M., Gambacorta, L., Martinez-Pages, J., Sevestre, P., and Worms, A. (2003). “Financial Systems and the Role of Banks in Monetary Policy Transmission in the Euro Area”, in Ignazio Angeloni, Anil K Kashyap, and Benoit Mojon, eds., *Monetary Policy Transmission in the Euro area: A Study by the Eurosystem Monetary Transmission Network*. Cambridge: Cambridge University Press.
- Gambacorta, L. and Mistrulli, P.E. (2004), “Does Bank Capital Affect Lending Behavior?”, *Journal of Financial Intermediation*, Vol. 13, 436–457.

- Guichard, S., Haugh, D. and Cournede, B. (2009), “Quantifying the effect of financial conditions in the euro area, Japan, United Kingdom and United States?”, OECD Working Paper No. 677.
- Hempell, H.S. (2007a), ‘Credit constraints in the euro area? – Bankers’ perceptions’, *Kredit und Kapital*, 2007, Vol. 40, No.1, pp. 59-88.
- Hempell, H.S. (2007b), ‘Bankers’ Perception of Euro Area Lending Business’, paper presented at the ‘Second Ifo Conference on Survey Data in Economics – Methodology and Applications’ in Munich, October 2007.
- Judson, R.A. and Owen, A.L. (1999), “Estimating dynamic panel data models: a guide for macroeconomists”, *Economic Letters*, Vol. 65, pp. 9–15.
- Kashyap, A.N. and J. Stein (2000), “What do a million observations on banks say about the transmission of monetary policy?”, *American Economic Review*, Vol. 90, No 3, June, pp. 407-428.
- Kishan, R.P., Opiela, T.P. (2000), “Bank size, bank capital and the bank lending channel. *Journal of Money, Credit and Banking*”, Vol. 32 (1), 121–141.
- Kishan, R.P., Opiela, T.P. (2006), “Bank capital and loan asymmetry in the transmission of monetary policy”, *Journal of Banking & Finance*, Vol. 30, 259–285.
- Kiviet, J.F. (1995), “On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Models”, *Journal of Econometrics*, Vol. 68, pp. 53-78.
- Lown, C. and Morgan, D. (2006), “The Credit Cycle and the Business Cycle: New Findings Using the Loan Officer Opinion Survey,” *Journal of Money, Credit and Banking*, Vol. 38, No. 6, pp. 1575–1597.
- Maddaloni, A. and Peydró, J.L. (2009), “Bank Risk-Taking, Securitization, Supervision and Low Interest Rates: Evidence from Lending Standards”, ECB working paper, forthcoming.
- Nickel, S. (1981), “Biases in dynamic models with fixed effects”, *Econometrica*, Vol. 49, 1417–26.
- Peek, J. and Rosengren, E.S. (1995), “Bank Lending and the Transmission of Monetary Policy”; in Peek, J. and Rosengren, E.S. (eds.), *Is Bank Lending Important for the Transmission of Monetary Policy?*, Federal Reserve Bank of Boston Conference Series No. 39, pp. 47-68.
- Swiston, A. (2008). “A U.S. Financial Conditions Index: Putting Credit Where Credit is Due”, IMF Working Paper Series, 08/161.
- Van den Heuvel, S. J. (2002), “Does bank capital matter for monetary transmission?”, *Economic Policy Review*, Federal Reserve Bank of New York, 259-265;
- Van den Heuvel, S. J. (2007), “The Bank Capital Channel of Monetary Policy”, mimeo, University of Pennsylvania.

Table 1: Descriptive statistics

a) Loans to non-financial corporations

	mean	std	min	max
dln quarterly loans to non-financial corporations _{i,t}	2.04	2.4	-6.8	9.1
credit standards for loans to enterprises (BLS) _{i,t-3}	21.05	34.01	-50	100
banks' cost of capital (BLS) _{i,t-3}	12.78	20.16	-25	100
access to market financing (BLS) _{i,t-3}	10.55	23.88	-50	100
banks' liquidity situation (BLS) _{i,t-3}	6.76	17.68	-33.3	80
expectations economic activity(BLS) _{i,t-3}	24.43	38.15	-80	100
firm/industry specific outlook (BLS) _{i,t-2}	30.03	34.17	-25	100
margins on average loans (BLS) _{i,t-3}	9.85	46.1	-100	100
margins on riskier loans (BLS) _{i,t-1}	9.07	45.44	-100	100
restrictions on sizeof loans/credit lines (BLS) _{i,t-1}	9.07	45.44	-100	100
demand for loans to enterprises (BLS) _{i,t-2}	-2.72	33.94	-100	75
dln quarterly real GDP _{i,t-1}	0.34	1.12	-5.6	6.76
Eonia _{t-1}	2.59	1.05	0.36	4.27
10 year gov bond yield _{t-2}	4.05	0.48	3.02	5.87
inflation _{i,t-4}	1.93	0.87	0.21	5.04

countries: 11 sample period: 2003Q3-2009Q4 no. obs.: 286

b) Housing loans

	mean	std	min	max	no. obs.
dln quarterly loans to households for house purchase _{i,t}	2.39	2.86	-18.66	14.56	319
credit standards for loans to households for house purchase (BLS) _{i,t}	7.75	31.57	-100	100	319
costs of funds and balance sheet constraint (BLS) _{i,t}	7.07	18.77	-66.7	100	319
expectations economic activity (BLS) _{i,t}	16.57	27.51	-40	100	319
housing market prospects (BLS) _{i,t}	15.52	29.14	-40	100	319
margins on average loans (BLS) _{i,t-2}	-1.3	40.36	-100	100	297
margins on riskier loans (BLS) _{i,t-2}	17.15	28.52	-33.3	100	297
collateral requirements (BLS) _{i,t-3}	6.35	16.64	-40	90	286
loan-to-value ratio (BLS) _{i,t-1}	8.04	25.86	-40	100	319
demand for loans to to households for house purchase (BLS) _{i,t}	-1.89	46.94	-100	100	319
dln quarterly real GDP _{i,t-3}	0.38	1.09	-5.55	6.75	319
Eonia _{t-1}	2.63	1.01	0.36	4.27	319
10 year gov bond yield _{t-2}	4.12	0.52	3.02	5.87	319
dln nominal houseprices _{i,t-4}	1.28	1.81	-8.9	6.24	319

countries: 11 sample period: 2002Q4 (2003Q1/Q2/Q3)-2009Q4

Notes: In percentages, BLS-variables in net-percentages (for details see p. 7). – Sample period differs according to lag structure of regressors included.

Table 1: Descriptive statistics (contd.)

c) Turmoil related *ad hoc* BLS questions

	mean	std	min	max	no.obs
<i>BLS ad hoc questions on hampered market access in turmoil period regarding...</i>					
very short-term money market $t-3$	26.76	23.24	0	100	77
short-term money market $t-3$	56.87	27.17	0	100	77
short-term debt securities (e.g. certificates of deposit or commercial paper) $t-3$	47.11	28.14	0	100	77
medium to long-term debt securities (incl. covered bonds) $t-4$	60.28	24.83	0	100	77
securitisation of corporate loans $t-3$	37.06	24.58	0	100	66
securitisation of loans for house purchase $i, t-3$	40.14	28.04	0	90	77
ability to transfer credit risk off balance sheet $t-3$	27.89	22.43	0	100	77
<i>BLS ad hoc questions on impact of hampered market access on...</i>					
<u>money / debt markets:</u> quantity $t-4$	51.81	25.9	0	100	66
price $t-4$	61.45	24.68	0	100	66
<u>securitisation:</u> quantity $t-3$	38.86	27.82	0	100	77
price $t-4$	40.75	29.72	0	100	66
countries: 11	sample period: 2008Q2 (Q3)-2009Q4				

Notes: In net-percentages (for details see p. 7). – Sample period differs according to lag structure of regressors included; first date of inclusion of above *ad hoc* questions in BLS 2007 Q3.

Table 2a. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' changes credit standards and contributing factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
credit standards for loans to enterprises (BLS)_{i, t-3}	-.014 (.000***)								
banks' cost of capital (BLS)_{i, t-3}		-.023 (.000***)			-.023 (.000***)				-.015 (.001***)
access to market financing (BLS)_{i, t-3}			-.013 (.000***)		-.007 (.849)				
banks' liquidity situation (BLS)_{i, t-3}				-.013 (.001***)	.0001 (.974)				
expectations economic activity(BLS)_{i, t-3}						-.012 (.000***)		-.008 (.001***)	-.006 (.018**)
firm/industry specific outlook (BLS)_{i, t-2}							-.013 (.000***)	-.011 (.000***)	-.008 (.004***)
demand for loans to enterprises (BLS)_{i, t-2}	.012 (.000***)	.014 (.000***)	.016 (.000***)	.016 (.000***)	.014 (.000***)	.014 (.000***)	.014 (.000***)	.012 (.000***)	.011 (.000***)
dln real GDP_{i, t-1}	.176 (.004***)	.221 (.000***)	.207 (.001***)	.210 (.001***)	.225 (.000***)	.227 (.000***)	.195 (.002***)	.192 (.002***)	.199 (.001***)
Eonia_{t-1}	.785 (.000***)	.810 (.000***)	.802 (.000***)	.821 (.000***)	.807 (.000***)	.731 (.000***)	.785 (.000***)	.745 (.000***)	.744 (.000***)
10 year gov bond yield_{t-2}	-.676 (.000***)	-.836 (.000***)	-.814 (.000***)	-.835 (.000***)	-.819 (.000***)	-.832 (.000***)	-.799 (.000***)	-.840 (.000***)	-.771 (.000***)
inflation_{i, t-4}	.137 (.243)	.146 (.173)	.166 (.139)	.155 (.147)	.141 (.194)	.254 (.028**)	.298 (.011**)	.337 (.006***)	.283 (.018**)
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2	703.78***	577.40***	511.87***	500.99***	571.30***	902.35***	797.57***	1124.75***	965.69***
# observations	286	286	286	286	286	286	297	286	286
countries					11				

Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 2b. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' terms and conditions

	(1)	(2)	(3)	(4)
margins on average loans (BLS)_{i, t-3}	-.008 (.000***)			-.005 (.002***)
margins on riskier loans (BLS)_{i, t-1}		-.010 (.000***)		-.005 (.021**)
restrictions on size of loans/credit lines (BLS)_{i, t-1}			-.014 (.000***)	-.010 (.005***)
demand for loans to enterprises (BLS)_{i, t-2}	.014 (.000***)	.015 (.000***)	.017 (.000***)	.014 (.000***)
dln real GDP_{i, t-1}	.194 (.002***)	.226 (.000***)	.194 (.001***)	.155 (.013**)
Eonia_{t-1}	.769 (.000***)	.918 (.000***)	.894 (.000***)	.876 (.000***)
10 year gov bond yield_{t-2}	-.619 (.000***)	-.747 (.000***)	-.740 (.000***)	-.528 (.000***)
inflation_{i, t-4}	.197 (.081*)	.147 (.199)	.254 (.027**)	.281 (.017**)
constant; seasonal and country dummies	yes	yes	yes	yes
Wald χ^2	642.11***	603.74***	667.96***	865.11***
# observations	286	297	297	286
countries		11		

Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 2c. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' changes credit standards and contributing factors – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(8)	(9)
dlm loans to NFCs_{i,t-1}	.310 (.000***)	.322 (.000***)	.330 (.000***)	.330 (.000***)	.322 (.000***)	.293 (.000***)	.279 (.000***)	.283 (.000***)	.290 (.000***)	.297 (.000***)
credit standards for loans to enterprises (BLS)_{i,t-3}	-0.09 (.006***)									
banks' cost of capital (BLS)_{i,t-3}	-0.23 (.000***)				-0.18 (.011**)				-0.11 (.034**)	
access to market financing (BLS)_{i,t-3}			-0.10 (.030**)		.0001 (.991)					
banks' liquidity situation (BLS)_{i,t-3}					-0.13 (.013**)				-0.01 (.894)	
expectations economic activity(BLS)_{i,t-3}							-0.11 (.006**)		-0.06 (.154)	
firm/industry specific outlook (BLS)_{i,t-2}									-0.04 (.370)	
demand for loans to enterprises (BLS)_{i,t-2}	-0.13 (.000***)									
dlm real GDP_{i,t-1}	.013 (.000***)	.013 (.000***)	.014 (.000***)	.013 (.000***)	.012 (.000***)	.011 (.000***)	.010 (.001***)	.009 (.003***)	.009 (.004***)	.009 (.003***)
Eonia_{t-1}	.255 (.008***)	.273 (.002***)	.266 (.004***)	.294 (.001***)	.271 (.003***)	.255 (.003***)	.240 (.011**)	.198 (.025**)	.191 (.031**)	.197 (.026**)
10 year gov bond yield_{t-2}	.504 (.000***)	.487 (.000***)	.504 (.000***)	.510 (.000***)	.487 (.000***)	.471 (.000***)	.521 (.000***)	.476 (.000***)	.461 (.000***)	.477 (.000***)
inflation_{i,t-4}	-0.614 (.007***)	-0.633 (.005***)	-0.682 (.004***)	-0.684 (.003***)	-0.630 (.006***)	-0.714 (.002***)	-0.733 (.000***)	-0.720 (.002***)	-0.644 (.004***)	-0.654 (.004***)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# observations	286	286	286	286	286	286	297	286	286	286
countries	11									

Notes: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 2d. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' terms and conditions – (robustness)

	(1)	(2)	(3)	(4)
dlm loans to NFCs_{i,t-1}	.315 (.000***)	.316 (.000***)	.299 (.000***)	.304 (.000***)
margins on average loans (BLS)_{i,t-3}	-0.005 (.040**)		.001 (.754)	
margins on riskier loans (BLS)_{i,t-1}			-0.006 (.107)	
restrictions on sizeof loans/credit lines (BLS)_{i,t-1}			-0.14 (.002***)	
demand for loans to enterprises (BLS)_{i,t-2}	.013 (.000***)	.013 (.000***)	.013 (.000***)	.013 (.000***)
dlm real GDP_{i,t-1}	.288 (.003***)	.274 (.003***)	.236 (.016**)	.229 (.020**)
Eonia_{t-1}	.532 (.000***)	.590 (.000***)	.603 (.000***)	.619 (.000***)
10 year gov bond yield_{t-2}	-0.651 (.000***)	-0.628 (.001***)	-0.619 (.002***)	-0.588 (.002***)
inflation_{i,t-4}	.132 (.329)	.151 (.255)	.165 (.209)	.177 (.180)
seasonal dummies	yes	yes	yes	yes
# observations	286	297	297	286
countries	11			

Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 3a. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks' changes credit standards and contributing factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
credit standards for loans to households for house purchase (BLS) $_{i,t}$	-.008 (.000***)							
costs of funds and balance sheet constraint (BLS) $_{i,t}$		-.021 (.000***)				-.019 (.000***)	-.020 (.000***)	-.021 (.000***)
expectations economic activity (BLS) $_{i,t}$			-.007 (.008***)		-.004 (.327)	-.002 (.544)		
housing market prospects (BLS) $_{i,t}$				-.008 (.005***)	-.005 (.260)		-.0001 (.637)	
demand for loans to households for house purchase (BLS) $_{i,t}$	.017 (.000***)	.015 (.000***)	.017 (.000***)	.017 (.000***)	.017 (.000***)	.014 (.000***)	.014 (.000***)	.015 (.000***)
dln real GDP $_{i,t-3}$	.330 (.000***)	.301 (.000***)	.327 (.000***)	.337 (.000***)	.326 (.000***)	.282 (.000***)	.294 (.000***)	.301 (.000***)
Eonia $_{t-1}$	-.110 (.196)	-.074 (.417)	-.111 (.193)	-.100 (.241)	-.107 (.209)	-.076 (.408)	-.071 (.440)	-.074 (.417)
10 year gov bond yield $_{t-2}$	-.672 (.000***)	-.712 (.000***)	-.580 (.000***)	-.616 (.000***)	-.579 (.000***)	-.658 (.000***)	-.681 (.000***)	-.712 (.000***)
dln nom. houseprices $_{i,t-4}$	.309 (.000***)	.297 (.000***)	.309 (.000***)	.307 (.000***)	.309 (.000***)	.301 (.000***)	.300 (.000***)	.297 (.000***)
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2	722.91***	628.56***	690.45***	710.72***	698.79***	605.98***	615.10***	628.56***
# observations					319			
countries					11			

Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 3b. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks' terms and conditions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
margins on average loans (BLS) $_{i,t-2}$	-.008 (.000***)		-.0002 (.910)				
margins on riskier loans (BLS) $_{i,t-2}$		-.017 (.000***)	-.017 (.000***)				-.013 (.000***)
collateral requirements (BLS) $_{i,t-3}$				-.009 (.037**)		-.004 (.375)	
loan-to-value ratio (BLS) $_{i,t-1}$					-.015 (.000***)	-.014 (.000***)	-.012 (.000***)
demand for loans to to households for house purchase (BLS) $_{i,t}$	.017 (.000***)	.016 (.000***)	.016 (.000***)	.019 (.000***)	.015 (.000***)	.016 (.000***)	.014 (.000***)
dln real GDP $_{i,t-3}$	.285 (.000***)	.238 (.001***)	.243 (.001***)	.306 (.000***)	.262 (.000***)	.306 (.000***)	.254 (.000***)
Eonia $_{t-1}$	-.204 (.037**)	-.219 (.028**)	-.223 (.025**)	-.153 (.127)	-.122 (.207)	-.185 (.059*)	-.250 (.012**)
10 year gov bond yield $_{t-2}$	-.940 (.000***)	-.916 (.000***)	-.919 (.000***)	-1.073 (.000***)	-.831 (.000***)	-.919 (.000***)	-.800 (.000***)
dln nom. houseprices $_{i,t-4}$	.286 (.000***)	.285 (.000***)	.284 (.000***)	.284 (.000***)	.280 (.000***)	.263 (.000***)	.270 (.000***)
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes
Wald χ^2	717.53***	724.63***	729.62***	644.54***	631.63***	685.75***	737.95***
# observations	297	297	297	286	308	286	297
countries				11			

Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 3c. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks' changes credit standards and contributing factors – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
dl n loans to households for house purchase $i, t-1$	.216 (.000***)	.211 (.000***)	.218 (.000***)	.219 (.000***)	.219 (.000***)	.216 (.000***)	.215 (.000***)	.211 (.000***)
credit standards for loans to households for house purchase (BLS) i, t	-0.003 (.516)							
costs of funds and balance sheet constraint (BLS) i, t	-0.021 (.004***)				-0.025 (.001***)		-0.024 (.001***)	-0.021 (.004***)
expectations economic activity (BLS) i, t			.0004 (.940)		.0002 (.979)		.008 (.204)	
housing market prospects (BLS) i, t					-0.001 (.882)		-0.001 (.898)	
demand for loans to households for house purchase (BLS) i, t	.017 (.000***)	.015 (.000***)	.015 (.000***)	.018 (.000***)	.012 (.000***)	.016 (.000***)	.016 (.000***)	.015 (.000***)
dl n real GDP $i, t-3$	.461 (.005***)	.441 (.002***)	.466 (.005***)	.465 (.005***)	.271 (.003***)	.440 (.007***)	.436 (.007***)	.441 (.002***)
Eonia $t-1$	-.220 (.216)	.192 (.284)	-.217 (.224)	-.217 (.224)	.487 (.000***)	-.176 (.324)	-.178 (.316)	.192 (.284)
10 year gov bond yield $t-2$	-.424 (.131)	-.421 (.117)	-.463 (.108)	-.467 (.087*)	-.630 (.006***)	-.536 (.058*)	-.517 (.052**)	-.421 (.117)
dl n nom. houseprices $i, t-4$	.170 (.032**)	.152 (.054**)	.173 (.029**)	.173 (.029**)	.088 (.515)	.157 (.047**)	.153 (.054**)	.152 (.054**)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes
# observations					319			
countries					11			

Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 3d. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks' terms and conditions – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
dl n loans to NFCs $i, t-1$	.211 (.000***)	.190 (.000***)	.190 (.002***)	.215 (.000***)	.191 (.001***)	.209 (.000***)	.188 (.002***)
margins on average loans (BLS) $i, t-2$	-0.006 (.123)		-0.001 (.876)				
margins on riskier loans (BLS) $i, t-2$	-0.015 (.015**)		-0.016 (.055*)				-0.013 (.040**)
collateral requirements (BLS) $i, t-3$					-0.011 (.064*)		-0.003 (.747)
loan-to-value ratio (BLS) $i, t-1$					-0.012 (.061*)		-0.008 (.254)
demand for loans to households for house purchase (BLS) i, t	.016 (.000***)	.014 (.000***)	.014 (.000***)	.016 (.000***)	.013 (.000***)	.014 (.000***)	.013 (.001***)
dl n real GDP $i, t-3$	.344 (.014**)	.303 (.031**)	.301 (.029**)	.384 (.009***)	.384 (.007***)	.387 (.008***)	.310 (.027**)
Eonia $t-1$	-.277 (.080*)	-.358 (.035*)	-.356 (.035**)	-.250 (.263)	-.301 (.124)	-.286 (.209)	-.374 (.026**)
10 year gov bond yield $t-2$	-.578 (.088*)	-.536 (.111)	-.543 (.108)	-.687 (.039**)	-.635 (.083*)	-.635 (.059*)	-.505 (.131)
dl n nom. houseprices $i, t-4$	.226 (.002***)	.229 (.002***)	.231 (.001***)	.247 (.008***)	.213 (.008***)	.242 (.009***)	.224 (.002***)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes
# observations	297	297	297	286	308	286	297
countries					11		

Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively.

Table 4a. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' changes credit standards and contributing factors – differentiating between pre-crisis and crisis periods

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
credit standards for loans to enterprises (BLS) _{i,t-3}	crisis	-.022 (.000***)										
	pre-crisis	-.012 (.000***)										
banks' cost of capital (BLS) _{i,t-3}	crisis		-.038 (.000***)					-.033 (.000***)			-.014 (.001***)	-.015 (.001***)
	pre-crisis		-.014 (.001***)					-.005 (.239)				
access to market financing (BLS) _{i,t-3}	crisis			-.026 (.000***)					-.020 (.000***)			
	pre-crisis			-.005 (.171)					-.0001 (.968)			
banks' liquidity situation (BLS) _{i,t-3}	crisis				-.037 (.000***)					-.033 (.000***)		
	pre-crisis				-.001 (.809)					-.001 (.813)		
expectations economic activity (BLS) _{i,t-3}	crisis					-.021 (.000***)		-.006 (.009***)	-.008 (.001***)	-.007 (.002***)	-.015 (.000***)	-.007 (.006***)
	pre-crisis					-.009 (.000***)					-.004 (.155)	
firm/industry specific outlook (BLS) _{i,t-1}	crisis						-.023 (.000***)	-.007 (.006***)	-.008 (.006***)	-.009 (.001***)	-.007 (.011**)	-.017 (.000***)
	pre-crisis						-.011 (.000***)				-.005 (.116)	
demand for loans to enterprises (BLS) _{i,t}		.012 (.000***)	.014 (.000***)	.016 (.000***)	.016 (.000***)	.013 (.000***)	.012 (.000***)	.011 (.000***)	.012 (.000***)	.011 (.000***)	.011 (.000***)	.009 (.000***)
dln GDP _{i,t-1}		.114 (.079*)	.152 (.014**)	.148 (.015**)	.137 (.026**)	.132 (.040**)	.126 (.077*)	.106 (.102)	.108 (.088*)	.087 (.167)	.100 (.139)	.107 (.123)
Eonia _{t-1}		.847 (.000***)	.888 (.000***)	.870 (.000***)	.925 (.000***)	.788 (.000***)	.880 (.000***)	.828 (.000***)	.789 (.000***)	.839 (.000***)	.800 (.000***)	.833 (.000***)
10 year gov bond yield _{t-2}		-.726 (.000***)	-.903 (.000***)	-.853 (.000***)	-.868 (.000***)	-.846 (.000***)	-.820 (.000***)	-.823 (.000***)	-.833 (.000***)	-.854 (.000***)	-.792 (.000***)	-.745 (.000***)
inflation _{i,t-4}		.142 (.210)	.149 (.163)	.165 (.126)	.253 (.014**)	.229 (.037**)	.262 (.018**)	.275 (.016**)	.299 (.009***)	.393 (.000***)	.245 (.031**)	.262 (.019**)
constant, seasonal and country dummies		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2		813.387***	665.50***	608.74***	612.49***	1143.60***	951.06***	1148.98***	1191.24***	1247.30***	1201.60***	1195.64***
# observations							286					
countries							11					

Notes: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 4b. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' terms and conditions – differentiating between pre-crisis and crisis periods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
margins on average loans (BLS) _{i,t+3}	crisis			-0.017 (.000***)				-0.017 (.000***)
	pre-crisis	-0.020 (.165)		-0.001 (.504)		-0.006 (.001***)		-0.003 (.870)
margins on riskier loans (BLS) _{i,t-1}	crisis	-0.010 (.000***)			-0.006 (.059*)		-0.007 (.003***)	.003 (.422)
	pre-crisis	-0.010 (.000***)			-0.008 (.001***)			-0.009 (.000***)
restrictions on size of loans/credit lines (BLS) _{i,t-1}	crisis		-0.020 (.000***)	-0.011 (.001***)	-0.010 (.005***)	-0.019 (.000***)	-0.015 (.001***)	-0.017 (.006***)
	pre-crisis		-0.008 (.034**)			-0.007 (.085*)	-0.005 (.243)	-0.005 (.180)
demand for loans to enterprises (BLS) _{i,t}	.013 (.000***)	.015 (.000***)	.016 (.000***)	.014 (.000***)	.016 (.000***)	.014 (.000***)	.015 (.000***)	.014 (.000***)
ln GDP _{i,t-1}	.060 (.359)	.230 (.000***)	.164 (.010**)	.045 (.506)	.212 (.001***)	.124 (.062*)	.174 (.006***)	.070 (.301)
Eonia _{t-1}	.882 (.000***)	.923 (.000***)	.947 (.000***)	.918 (.000***)	.910 (.000***)	.887 (.000***)	.976 (.000***)	.864 (.000***)
10 year gov bond yield _{t-2}	-0.844 (.000***)	-0.749 (.000***)	-0.735 (.000***)	-0.773 (.000***)	-0.673 (.000***)	-0.543 (.000***)	-0.665 (.000***)	-0.790 (.000***)
inflation _{i,t-4}	.176 (.092*)	.143 (.213)	.201 (.077*)	.247 (.022**)	.252 (.030**)	.248 (.032**)	.199 (.082*)	.205 (.055**)
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2	888.85***	595.18***	697.08***	1009.21***	702.89***	848.46***	720.45***	1084.82***
# observations					286			
countries					11			

Notes: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. –The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 4c. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' changes credit standards and contributing factors – differentiating between pre-crisis and crisis periods – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
dlm loans to enterprises $i, t-1$	.308 (.000***)	.317 (.000***)	.327 (.000***)	.311 (.000***)	.282 (.000***)	.278 (.000***)	.284 (.000***)	.284 (.000***)	.269 (.000***)	.281 (.000***)	.288 (.000***)
credit standards for loans to enterprises (BLS) $i, t-3$											
crisis											
pre-crisis											
banks' cost of capital (BLS) $i, t-3$											
crisis											
pre-crisis											
access to market financing (BLS) $i, t-3$											
crisis											
pre-crisis											
banks' liquidity situation (BLS) $i, t-3$											
crisis											
pre-crisis											
expectations economic activity (BLS) $i, t-3$											
crisis											
pre-crisis											
firm/industry specific outlook (BLS) $i, t-1$											
crisis											
pre-crisis											
demand for loans to enterprises (BLS) i, t	.013 (.000***)	.012 (.000***)	.014 (.000***)	.013 (.000***)	.011 (.000***)	.009 (.002***)	.009 (.004***)	.009 (.004***)	.008 (.006***)	.009 (.005***)	.009 (.004***)
dlm GDP $i, t-1$	.189 (.072*)	.225 (.019**)	.223 (.039**)	.228 (.014**)	.148 (.177)	.099 (.290)	.135 (.163)	.153 (.150)	.122 (.201)	.095 (.390)	.063 (.554)
Eonia $t-1$	.562 (.000***)	.532 (.000***)	.541 (.000***)	.586 (.000***)	.550 (.000***)	.616 (.000***)	.508 (.000***)	.504 (.000***)	.541 (.000***)	.533 (.000***)	.563 (.000***)
10 year gov bond yield $t-2$	-.629 (.005***)	-.636 (.005***)	-.691 (.003***)	-.712 (.002***)	-.720 (.002***)	-.709 (.000***)	-.645 (.005***)	-.707 (.002***)	-.698 (.002***)	-.647 (.004***)	-.602 (.009***)
inflation $i, t-4$	.161 (.270)	.064 (.644)	.106 (.446)	.101 (.466)	.214 (.115)	.127 (.386)	.216 (.132)	.290 (.047**)	.272 (.054*)	.157 (.274)	.167 (.238)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# observations											
countries											

Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 4d. Determinants of quarterly growth rates in bank lending to non-financial corporations – banks' terms and conditions – differentiating between pre-crisis and crisis periods – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
dln loans to enterprises $i, t-1$	.300 (.000***)	.317 (.000***)	.298 (.000***)	.293 (.000***)	.305 (.000***)	.309 (.000***)	.303 (.000***)	.286 (.000***)
margins on average loans (BLS) $i, t-3$								
crisis				-0.016 (.000***)				-0.013 (.002***)
pre-crisis				-0.00003 (.992)			-0.004 (.103)	-0.001 (.684)
margins on riskier loans (BLS) $i, t-1$								
crisis								
pre-crisis								
restrictions on size of loans/credit lines (BLS) $i, t-1$								
crisis								
pre-crisis								
demand for loans to enterprises (BLS) i, t	.012 (.000***)	.012 (.000***)	.013 (.000***)	.012 (.000***)	.012 (.000***)	.013 (.000***)	.013 (.000***)	.012 (.000***)
dln GDP $i, t-3$	.134 (.188)	.247 (.009***)	.188 (.056**)	.084 (.411)	.211 (.035**)	.145 (.121)	.178 (.068**)	.086 (.407)
Eonia $t-1$	.587 (.000***)	.620 (.000***)	.647 (.000***)	.634 (.000***)	.627 (.000***)	.591 (.000***)	.652 (.000***)	.619 (.000***)
10 year gov bond yield $t-2$	-.731 (.003***)	-.607 (.003***)	-.618 (.001***)	-.667 (.006***)	-.563 (.006***)	-.508 (.044**)	-.575 (.004***)	-.721 (.003***)
inflation $i, t-4$	.098 (.514)	.127 (.377)	.106 (.460)	.133 (.381)	.167 (.244)	.213 (.139)	.124 (.392)	.141 (.358)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes
# observations					286			
countries					11			

Notes: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 5a. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks' changes credit standards and contributing factors – differentiating between pre-crisis and crisis periods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
credit standards for loans to households for house purchase (BLS)_{i,t}	crisis	-0.013 (.000***)							
	pre-crisis	-0.004 (.183)							
costs of funds and balance sheet constraint_{i,t}	crisis		-0.026 (.000***)		-0.025 (.000***)	-0.026 (.000***)	-0.016 (.002***)	-0.013 (.006***)	-0.018 (.008***)
	pre-crisis		-0.011 (.096*)		-0.011 (.136)	-0.011 (.120)			-0.012 (.099*)
expectations economic activity (BLS)_{i,t}	crisis		-0.013 (.000***)		-0.0002 (.962)		-0.005 (.197)		-0.028 (.001***)
	pre-crisis		.002 (.649)				.001 (.739)		.003 (.518)
housing market prospects (BLS)_{i,t}	crisis			-0.016 (.000***)		-0.0006 (.825)		-0.009 (.022**)	-0.032 (.000***)
	pre-crisis			-0.002 (.447)				-0.003 (.289)	.005 (.210)
demand for loans to households for house purchase (BLS)_{i,t}	.015 (.000***)	.014 (.000***)	.015 (.000***)	.014 (.000***)	.014 (.000***)	.014 (.000***)	.014 (.000***)	.013 (.000***)	.014 (.000***)
dln real GDP_{i,t-3}	.327 (.000***)	.306 (.000***)	.349 (.000***)	.348 (.000***)	.299 (.000***)	.308 (.000***)	.280 (.000***)	.298 (.000***)	.278 (.000***)
Eonia_{t-1}	-0.089 (.316)	-0.059 (.530)	-0.093 (.281)	-0.088 (.317)	-0.061 (.515)	-0.057 (.547)	.052 (.572)	.057 (.541)	-0.032 (.738)
10 year gov bond yield_{t-2}	-0.653 (.000***)	-0.685 (.000***)	-0.643 (.000***)	-0.635 (.000***)	-0.652 (.000***)	-0.675 (.000***)	-0.655 (.000***)	-0.672 (.000***)	-0.581 (.000***)
dln nom. houseprices_{i,t-4}	.298 (.000***)	.288 (.000***)	.284 (.000***)	.275 (.000***)	.289 (.000***)	.287 (.000***)	.292 (.000***)	.283 (.000***)	.275 (.000***)
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2	708.92***	630.63***	728.73***	721.39***	615.10***	616.65***	594.58***	623.10***	552.39***
# observations					319				
countries					11				

Notes: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. –The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 5b. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks’ terms and conditions – differentiating between pre-crisis and crisis periods

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
margins on average loans (BLS)_{i, t-2}	crisis	-0.19 (.000***)		-0.11 (.012**)				-0.15 (.000***)				-0.10 (.034**)
	pre-crisis		-0.02 (.241)	-0.03 (.152)						-0.005 (.006***)		.003 (.203)
margins on riskier loans (BLS)_{i, t-2}	crisis		-0.25 (.000***)	-0.15 (.005***)					-0.021 (.000***)			-0.19 (.002***)
	pre-crisis			-0.10 (.002***)	-0.13 (.001***)					-0.009 (.004***)		-0.12 (.000***)	-0.12 (.003***)
collateral requirements (BLS)_{i, t-3}	crisis				-0.20 (.000***)		-0.008 (.245)					
	pre-crisis				.003 (.557)		.001 (.792)					
loan-to-value ratio (BLS)_{i, t-1}	crisis					-0.20 (.000***)	-0.15 (.001***)	-0.10 (.001***)	-0.10 (.002***)	-0.16 (.000***)	-0.12 (.001***)	.0000 (.998)
	pre-crisis					-0.10 (.005***)	-0.12 (.001***)			-0.12 (.001***)	-0.10 (.009***)	-0.11 (.006***)
demand for loans to households for house purchase (BLS)_{i, t}		.015 (.000***)	.014 (.000***)	.014 (.000***)	.018 (.000***)	.014 (.000***)	.016 (.000***)	.013 (.000***)	.013 (.000***)	.014 (.000***)	.014 (.000***)	.014 (.000***)
ln real GDP_{i, t-3}		.334 (.000***)	.255 (.000***)	.293 (.000***)	.310 (.000***)	.258 (.000***)	.308 (.000***)	.324 (.000***)	.261 (.000***)	.294 (.000***)	.260 (.000***)	.297 (.000***)
Eonia_{t-1}		-.246 (.013**)	-.220 (.032**)	-.266 (.007***)	-.109 (.287)	-.102 (.297)	-.142 (.159)	-.280 (.005***)	-.257 (.012*)	-.218 (.027**)	-.226 (.024**)	-.296 (.002***)
10 year gov bond yield_{t-2}		-.935 (.000***)	-.890 (.000***)	-.913 (.000***)	-1.046 (.000***)	-.833 (.000***)	-.908 (.000***)	-.815 (.000***)	-.796 (.000***)	-.798 (.000***)	-.811 (.000***)	-.868 (.000***)
ln nom. houseprices_{i, t-4}		.265 (.000***)	.270 (.000***)	.263 (.000***)	.284 (.000***)	.276 (.000***)	.269 (.000***)	.262 (.000***)	.264 (.000***)	.280 (.000***)	.273 (.000***)	.263 (.000***)
constant; seasonal and country dummies		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2		720.34***	728.04***	752.34***	643.80***	632.71***	687.38***	719.54***	748.51***	749.20***	728.17***	853.73***
# observations		297	297	297	286	308	286	297	297	297	297	297
countries												

Notes: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. –The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 5c. Determinants of quarterly growth rates in bank lending to private households for house purchase – banks' changes credit standards and contributing factors – differentiating between pre-crisis and crisis periods – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
dln loans to households for house purchase $i, t-1$	.197 (.002***)	.198 (.002***)	.199 (.002***)	.194 (.002***)	.201 (.002***)	.200 (.002***)	.209 (.001***)	.201 (.002***)	.216 (.001***)
credit standards for loans to households for house purchase (BLS) i, t									
crisis									
pre-crisis									
costs of funds and balance sheet constraint i, t									
crisis									
pre-crisis									
expectations economic activity (BLS) i, t									
crisis									
pre-crisis									
housing market prospects (BLS) i, t									
crisis									
pre-crisis									
demand for loans to households for house purchase (BLS) i, t	.017 (.000***)	.016 (.000***)	.018 (.000***)	.018 (.000***)	.017 (.000***)	.017 (.000***)	.018 (.000***)	.017 (.000***)	.017 (.000***)
dln GDP $i, t-3$	.402 (.001***)	.389 (.002***)	.406 (.001***)	.413 (.001***)	.396 (.002***)	.391 (.002***)	.375 (.003***)	.390 (.002***)	.366 (.004***)
Eonia $t-1$	-.148 (.360)	-.120 (.447)	-.148 (.350)	-.135 (.395)	-.101 (.521)	-.106 (.506)	-.110 (.486)	-.110 (.491)	-.063 (.6878)
10 year gov bond yield $t-2$	-.445 (.092*)	-.460 (.088*)	-.491 (.068*)	-.500 (.062*)	-.557 (.042**)	-.535 (.049**)	-.533 (.048**)	-.544 (.044**)	-.510 (.059*)
dln nom. houseprices $i, t-4$	.309 (.001***)	.293 (.001***)	.308 (.001***)	.296 (.001***)	.288 (.002***)	.285 (.002***)	.300 (.001***)	.287 (.002***)	.295 (.001***)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes
# observations									
countries									

Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 5d. Determinants of quarterly growth rates in bank lending to households for house purchase – banks' terms and conditions – differentiating between pre-crisis and crisis periods – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
dln loans to households for house purchase $_{i,t-1}$	.165 (.002***)	.155 (.005***)	.157 (.004***)	.190 (.001***)	.166 (.001***)	.186 (.001***)	.165 (.002***)	.156 (.004***)	.187 (.001***)	.172 (.001***)	.145 (.006***)
margins on average loans (BLS) $_{i,t-2}$											
crisis	-.015 (.004***)		-.012 (.209)				-.014 (.029**)		-.004 (.436)		-.013 (.175)
pre-crisis	.001 (.832)		.005 (.352)				-.001 (.778)				.006 (.344)
margins on riskier loans (BLS) $_{i,t-2}$											
crisis		-.018 (.011**)	-.012 (.199)					-.016 (.053*)		-.011 (.121)	-.012 (.365)
pre-crisis		-.007 (.356)	-.008 (.512)					-.006 (.401)			-.010 (.282)
collateral requirements (BLS) $_{i,t-3}$											
crisis				-.009 (.481)		-.004 (.862)					
pre-crisis				-.001 (.905)		-.001 (.942)					
loan-to-value ratio (BLS) $_{i,t-1}$											
crisis					-.012 (.107)	-.007 (.490)	-.004 (.519)	-.004 (.547)	-.007 (.416)	-.004 (.615)	.007 (.546)
pre-crisis					-.010 (.199)	-.007 (.419)			-.008 (.269)	-.007 (.312)	-.011 (.161)
demand for loans to households for house purchase (BLS) $_{i,t}$	.015 (.000***)	.014 (.000***)	.014 (.001***)	.018 (.000***)	.014 (.000***)	.016 (.000***)	.014 (.001***)	.014 (.002***)	.015 (.000***)	.014 (.001***)	.013 (.002***)
dln real GDP $_{i,t-3}$	.334 (.013**)	.268 (.057*)	.308 (.026**)	.309 (.024**)	.296 (.031**)	.301 (.030**)	.330 (.014**)	.265 (.059*)	.255 (.070*)	.228 (.114)	.306 (.027**)
Eonia $_{t-1}$	.256 (.179)	.250 (.228)	.320 (.118)	.176 (.344)	.242 (.100)	-.210 (.288)	-.269 (.159)	-.266 (.201)	-.244 (.220)	-.306 (.144)	-.371 (.074*)
10 year gov bond yield $_{t-2}$	-.798 (.000***)	-.677 (.003***)	-.761 (.001***)	-.722 (.023**)	-.741 (.001***)	-.679 (.041**)	-.770 (.000***)	-.652 (.005***)	-.628 (.005***)	-.589 (.012**)	-.743 (.001***)
dln nom. houseprices $_{i,t-4}$	.372 (.000***)	.384 (.000***)	.369 (.000***)	.422 (.000***)	.389 (.000***)	.421 (.000***)	.373 (.000***)	.384 (.000***)	.399 (.000***)	.395 (.000***)	.380 (.000***)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# observations	297	297	297	286	308	286	297	297	297	297	297
countries						11					

Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses, obtained through 50 repetitions; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. –The cut-off date for crisis/non-crisis interaction terms is: 2007Q3.

Table 6a. Determinants of quarterly growth rates in bank lending to non-financial corporations –including variables from BLS-ad hoc questions on crisis specific impact of hampered access to funding markets and of capital constraints on bank lending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
hampered market access in turmoil period (BLS ad hoc questions)	very short-term money market _{i,t-3}	-0.10 (.011**)								
	short-term money market _{i,t-3}		-0.008 (.004****)							
	short-term debt securities (e.g. certificates of deposit or commercial paper) _{i,t-3}			-0.009 (.002****)						
	medium to long-term debt securities (incl. covered bonds) _{i,t-3}				-0.006 (.020**)					
impact of hampered market access on ... (BLS ad hoc questions)	securitisation of corporate loans _{i,t-4}				-0.020 (.000****)					
	ability to transfer credit risk off balance sheet _{i,t-3}					-0.014 (.002****)				
	money/debt markets: quantity _{i,t-4}						-0.008 (.012**)			
	price _{i,t-4}							-0.10 (.000****)		
securitisation:	quantity _{i,t-3}								-0.009 (.005****)	
	price _{i,t-4}									-0.17 (.000****)
credit standards for loans to enterprises (BLS) _{i,t-3}	-0.14 (.000****)	-0.13 (.000****)	-0.13 (.000****)	-0.13 (.000****)	-0.13 (.000****)	-0.14 (.000****)	-0.14 (.000****)	-0.13 (.000****)	-0.13 (.000****)	-0.13 (.000****)
demand for loans to enterprises (BLS) _{i,t}	.012 (.000****)	.012 (.000****)	.012 (.000****)	.012 (.000****)	.012 (.000****)	.012 (.000****)	.012 (.000****)	.012 (.000****)	.012 (.000****)	.011 (.000****)
ln real GDP _{i,t-1}	.174 (.004****)	.148 (.015****)	.131 (.032**)	.152 (.012**)	.084 (.180)	.127 (.043**)	.150 (.014**)	.133 (.033**)	.147 (.013**)	.103 (.103)
Eonia _{t-1}	.761 (.000****)	.769 (.000****)	.767 (.000****)	.774 (.000****)	.732 (.000****)	.768 (.000****)	.747 (.000****)	.741 (.000****)	.782 (.000****)	.742 (.000****)
10 year gov bond yield _{t-2}	-0.641 (.000****)	-0.639 (.000****)	-0.639 (.000****)	-0.653 (.000****)	-0.690 (.000****)	-0.673 (.000****)	-0.664 (.000****)	-0.676 (.000****)	-0.693 (.000****)	-0.747 (.000****)
inflation _{i,t-4}	.166 (.163)	.165 (.153)	.157 (.168)	.145 (.210)	.123 (.286)	.131 (.051*)	.116 (.326)	.109 (.351)	.168 (.147)	.088 (.469)
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Wald χ^2	741.91***	768.97***	774.34***	796.27***	845.01***	780.42***	763.27***	805.30***	813.24***	788.74***
# observations										
countries										

286

11

Notes: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – Variables on these ad hoc questions are available from 2007Q3.

Table 6b. Determinants of quarterly growth rates in bank lending to non-financial corporations –including variables from BLS-ad hoc questions on crisis specific impact of hampered access to funding markets and of capital constraints on bank lending – (robustness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
dln loans to enterprises _{i,t-1}	-315 (.000***)	-310 (.000***)	-310 (.000***)	-312 (.000***)	-313 (.000***)	-309 (.000***)	-313 (.000***)	-310 (.000***)	-308 (.000***)	-304 (.000***)
very short-term money market _{i,t-3}	-008 (.208)									
short-term money market _{i,t-3}		-.004 (.410)								
short-term debt securities (e.g. certificates of deposit or commercial paper) _{i,t-3}			-.003 (.634)							
medium to long-term debt securities (incl. covered bonds) _{i,t-3}				-.005 (.365)						
securitisation of corporate loans _{i,t-4}					-.011 (.119)					
ability to transfer credit risk off balance sheet _{i,t-3}						-.010 (.144)				
money/debt markets: quantity _{i,t-4}							-.008 (.177)			
price _{i,t-4}								-.009 (.091*)		
securitisation: quantity _{i,t-3}									-.007 (.239)	
price _{i,t-4}										-.014 (.011**)
credit standards for loans to enterprises (BLS) _{i,t-3}	-.008 (.023**)	-.008 (.059*)	-.008 (.028**)	-.007 (.063*)	-.007 (.057*)	-.008 (.031**)	-.007 (.075*)	-.006 (.116)	-.008 (.028**)	-.006 (.099*)
demand for loans to enterprises (BLS) _{i,t}	.012 (.000***)	.013 (.000***)	.013 (.000***)	.012 (.000***)	.012 (.000***)	.012 (.000***)	.012 (.000***)	.012 (.000***)	.012 (.000***)	.011 (.000***)
dln real GDP _{i,t-1}	.222 (.022**)	.227 (.020**)	.239 (.015**)	.226 (.021**)	.197 (.054*)	.206 (.037**)	.214 (.031**)	.198 (.045**)	.229 (.020**)	.191 (.052*)
Eonia _{t-1}	.483 (.000***)	.495 (.000***)	.498 (.000***)	.498 (.000***)	.475 (.000***)	.498 (.000***)	.460 (.000***)	.466 (.000***)	.483 (.000***)	.469 (.000***)
10 year gov bond yield _{t-2}	-.575 (.012**)	-.567 (.017**)	-.584 (.014**)	-.567 (.016**)	-.584 (.011**)	-.591 (.010**)	-.544 (.021**)	-.550 (.016**)	-.581 (.012**)	-.553 (.015**)
inflation _{i,t-4}	.193 (.174)	.186 (.195)	.196 (.180)	.172 (.251)	.128 (.394)	.175 (.216)	.142 (.333)	.132 (.358)	.149 (.319)	.073 (.625)
seasonal dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
# observations										
countries										

Notes: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – Bootstrap standard errors in parentheses; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – Variables on these ad hoc questions are available from 2007Q3.

Table 7a. Determinants of quarterly growth rates in bank lending to households for house purchase – including variables from BLS-ad hoc questions on crisis specific impact of hampered access to funding markets and of capital constraints on bank lending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
hampered market access in turmoil period (BLS ad hoc questions)	very short-term money market _{t, t-3}	-0.038 (.000***)									
	short-term money market _{t, t-3}		-0.22 (.000***)								
	short-term debt securities (e.g. certificates of deposit or commercial paper) _{t, t-3}			-0.031 (.000***)							
	medium to long-term debt securities (incl. covered bonds) _{t, t-3}				-0.030 (.000***)						
	securitisation of loans for house purchase _{t, t-3}					-0.034 (.000***)					
	ability to transfer credit risk off balance sheet _{t, t-3}						-0.041 (.000***)				
	money/debt markets: quantity _{t, t-3}							-0.031 (.000***)			
	price _{t, t-3}								-0.030 (.000***)		
	quantity _{t, t-3}									-0.037 (.000***)	
	price _{t, t-3}										-0.034 (.000***)
impact of hampered market access on ... (BLS ad hoc questions)	credit standards for loans to households for house purchase (BLS) _{t, t}	-0.005 (.000***)	-0.006 (.007***)	-0.004 (.035**)	-0.003 (.084*)	-0.005 (.000***)	-0.003 (.084*)	-0.005 (.011**)	-0.005 (.006**)	-0.005 (.011**)	
	demand for loans to households for house purchase (BLS) _{t, t}	.013 (.000***)	.012 (.000***)	.011 (.000***)	-0.010 (.000***)	.010 (.000***)	.011 (.000***)	.009 (.000***)	.010 (.000***)	.010 (.000***)	
	dln real GDP _{t, t-3}	.290 (.000***)	.254 (.000***)	.329 (.000***)	.250 (.000***)	.291 (.000***)	.309 (.000***)	.245 (.000***)	.204 (.001***)	.291 (.000***)	
	Eonia _{t-1}	-3.48 (.000***)	-2.96 (.002***)	-4.04 (.000***)	-3.85 (.000***)	-3.68 (.000***)	-3.33 (.000***)	-4.45 (.000***)	-4.10 (.000***)	-3.88 (.000***)	
	10 year gov bond yield _{t-2}	-5.36 (.000***)	-5.38 (.000***)	-4.11 (.001**)	-4.14 (.002**)	-4.31 (.000***)	-5.52 (.000***)	-4.12 (.000***)	-4.73 (.000***)	-4.47 (.000***)	
	dln nom. houseprices _{t, t-4}	.273 (.000**)	.252 (.000***)	.257 (.000***)	.235 (.000***)	.237 (.000***)	.258 (.000***)	.249 (.000***)	.236 (.000***)	.249 (.000***)	
	constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	
	Wald χ^2	922.99***	961.10***	950.06***	907.13***	980.63***	905.04***	1119.42***	1110.08***	1039.74***	
	# observations										319
	countries										11

Notes: Dependent variables are quarterly growth rates of bank lending to households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for heteroskedasticity, cross-sectional correlations and panel-specific autocorrelation. – BLS variables in net percentages by country. *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – Variables on these ad hoc questions are available from 2007Q3.

Table 7b. Determinants of quarterly growth rates in bank lending to households for house purchase – including variables from BLS-ad hoc questions on specific impact of hampered access to funding markets and of capital constraints on bank lending – (robustness)

hampered market access in turmoil period (BLS ad hoc questions)	dln loans to households for house purchase _{i, t-1}	.156 (.015**)	.143 (.029**)	.137 (.032**)	.143 (.029**)	.164 (.010**)	.136 (.035**)	.138 (.029**)	.139 (.031**)	.156 (.013**)	.164 (.009***)	
	very short-term money market _{i, t-3}											
			-.034 (.001***)									
	short-term money market _{i, t-3}											
	short-term debt securities (e.g. certificates of deposit or commercial paper) _{i, t-3}											
medium to long-term debt securities (incl. covered bonds) _{i, t-3}												
securitisation of loans for house purchase _{i, t-3}												
ability to transfer credit risk off balance sheet _{i, t-3}												
money/debt markets: quantity _{i, t-3}												
price _{i, t-3}												
quantity _{i, t-3}												
price _{i, t-3}												
securitisation: quantity _{i, t-3}												
price _{i, t-3}												
impact of hampered market access on ... (BLS ad hoc questions)												
credit standards for loans to households for house purchase (BLS) _{i, t}												
demand for loans to households for house purchase (BLS) _{i, t}												
dln real GDP _{i, t-3}												
Eonia _{t-1}												
10 year gov bond yield _{t-2}												
dln nom. houseprices _{i, t-4}												
# observations countries												

Notes: Dependent variables are quarterly growth rates of bank lending to households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q4. Corrected LSDV panel regressions including lagged dependent variable and seasonal dummies. – BLS variables in net percentages by country. – *Bootstrap standard errors in parentheses, obtained through 50 repetitions*; *, **, *** reflect a statistical significance at the level of 10%, 5% and 1%, respectively. – Variables on these ad hoc questions are available from 2007Q3.

Table 8: Test for significance of differences in crisis and pre-crisis coefficients*

a) Loans to non-financial corporations – (Tables 4a – 4d (robustness))

	Tab. column	Tab. 4a	Tab. 4c (robustness)
credit standards for loans to enterprises (BLS) _{i,t-3}	(1)	.006***	.267
banks' cost of capital (BLS) _{i,t-3}	(2)	.000***	.228
	(7)	.000***	.170
access to market financing (BLS) _{i,t-3}	(3)	.000***	.334
	(8)	.000***	.389
banks' liquidity situation (BLS) _{i,t-3}	(4)	.000***	.084*
	(9)	.000***	.075*
expectations economic activity (BLS) _{i,t-3}	(5)	.000***	.064*
	(10)	.000***	.079*
firm/industry specific outlook (BLS) _{i,t-1}	(6)	.000***	.002***
	(11)	.000***	.031**
	Tab. column	Tab. 4b	Tab. 4d (robustness)
margins on average loans (BLS) _{i,t-3}	(1)	.000***	.006***
	(4)	.000***	.014**
	(8)	.000***	.006***
margins on riskier loans (BLS) _{i,t-1}	(2)	.964	.509
	(5)	.432	.720
	(8)	.002***	.189
restrictions on size of loans/credit lines (BLS) _{i,t-1}	(3)	.026**	.200
	(6)	.030**	.241
	(7)	.059*	.228
	(8)	.105	.426

b) Housing loans – (Tables 5a – 5d (robustness))

	Tab. column	Tab. 5a	Tab. 5c (robustness)
credit standards for loans to households for house purchase (BLS) _{i,t}	(1)	.014**	.704
costs of funds and balance sheet constraint _{i,t}	(2)	.065*	.707
	(5)	.101	.492
	(6)	.073*	.535
	(9)	.532	.344
expectations economic activity (BLS) _{i,t}	(3)	.001***	.683
	(7)	.187	.482
	(9)	.001***	.017**
housing market prospects (BLS) _{i,t}	(4)	.000***	.235
	(8)	.005***	.827
	(9)	.000***	.028**
	Tab. column	Tab. 5b	Tab. 5d (robustness)
margins on average loans (BLS) _{i,t-2}	(1)	.000***	.012**
	(3)	.004***	.135
	(7)	.000***	.026**
	(11)	.012**	.104
margins on riskier loans (BLS) _{i,t-2}	(2)	.000***	.159
	(3)	.792	.755
	(8)	.003***	.244
	(11)	.284	.881
collateral requirements (BLS) _{i,t-3}	(4)	.005***	.588
	(6)	.350	.897
loan-to-value ratio (BLS) _{i,t-1}	(5)	.019**	.860
	(6)	.621	.995
	(9)	.371	.898
	(10)	.566	.773
	(11)	.079*	.233

Notes: Reported p-values of Wald-test on the significance of the difference in coefficients in the pre-crisis and crisis period for regressions reported in Tables 4a) – d) and 5 a) – d), respectively; * notes significance at 10% level or below, ** at 5% and *** at 1%.

